$$
H_{102} = \begin{bmatrix}
-6\,\mu + U & \frac{-\mathbf{i}}{2}\,\sqrt{3}\,t & \frac{-\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t - \frac{3\,t}{2\,\sqrt{2}} & 0 & 0 & 0 & \frac{3\,\mathbf{i}\,t}{\sqrt{2}} & 0 & -\left(\sqrt{\frac{3}{2}}\,t\right) & 0 & \frac{\sqrt{\frac{3}{2}}\,t}{2} + \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 & 0 & \frac{-3}{2}\,\mathbf{i}\,t & \frac{-3\,\sqrt{\frac{3}{2}}\,t}{2} - \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 \\
\frac{\mathbf{i}}{2}\,\sqrt{3}\,t & -6\,\mu + U & 0 & 0 & 0 & \frac{\sqrt{\frac{3}{2}}\,t}{2} - \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 & \frac{-3\,\sqrt{\frac{3}{2}}\,t}{2} - \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}\,t}{2} \\
\frac{\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t - \frac{3\,t}{2\,\sqrt{2}} & 0 & -6\,\mu + U & 0 & 0 & \sqrt{3}\,t & 0 & 0 & 0 & 0 & 0 & \sqrt{3}\,t & 0 & 0 & 0 & \frac{-\left(\sqrt{\frac{3}{2}}\,t\right)}{2} - \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} \\
0 & 0 & 0 & -6\,\mu + 3\,U & 0 & \sqrt{2}\,t & 0 & -\mathbf{i}\,\sqrt{6}\,t & 0 & 0 & 0 & \sqrt{2}\,t & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -6\,\mu + 3\,U & 0 & 0 & 0 & 0 & 0 & 0 & t + \mathbf{i}\,\sqrt{3}\,t & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{\frac{3}{2}}\,t}{2} + \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & \sqrt{3}\,t & \sqrt{2}\,t & 0 & -6\,\mu + 2\,U & \frac{-t}{2} - \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{2\,\sqrt{2}} & t & 0 \\
\frac{\frac{-3}{2}\,\mathbf{i}\,t}{\sqrt{2}} & 0 & 0 & 0 & 0 & \frac{-t}{2} + \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & -6\,\mu + 2\,U & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\left(\frac{t}{\sqrt{2}}\right) \\
0 & \frac{-3\,\sqrt{\frac{3}{2}}\,t}{2} + \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 & \mathbf{i}\,\sqrt{6}\,t & 0 & 0 & 0 & -6\,\mu + 2\,U & \frac{t}{2} + \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & 0 & \frac{t}{2} - \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & 0 & 0 & \frac{\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t - \frac{3\,t}{2\,\sqrt{2}} & 0 & 0 \\
-\left(\sqrt{\frac{3}{2}}\,t\right) & 0 & 0 & 0 & 0 & 0 & 0 & \frac{t}{2} - \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & -6\,\mu + 2\,U & -\left(\sqrt{2}\,t\right) & 0 & \frac{t}{2} + \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & \sqrt{2}\,t & 0 & 0 & \frac{t}{\sqrt{2}} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\left(\sqrt{2}\,t\right) & -6\,\mu + 2\,U & \mathbf{i}\,\sqrt{\frac{3}{2}}\,t - \frac{t}{\sqrt{2}} & 0 & 0 & t - \mathbf{i}\,\sqrt{3}\,t & 0 & 0 \\
\frac{\sqrt{\frac{3}{2}}\,t}{2} - \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{t}{2} + \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & 0 & -\mathbf{i}\,\sqrt{\frac{3}{2}}\,t - \frac{t}{\sqrt{2}} & -6\,\mu + 2\,U & \frac{-t}{2} + \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & \mathbf{i}\,\sqrt{\frac{3}{2}}\,t - \frac{t}{\sqrt{2}} & 0 & 0 & \frac{-\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{2\,\sqrt{2}} \\
0 & 0 & \sqrt{3}\,t & \sqrt{2}\,t & t - \mathbf{i}\,\sqrt{3}\,t & 0 & 0 & 0 & \frac{t}{2} - \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & 0 & \frac{-t}{2} - \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & -6\,\mu + 2\,U & 0 & 0 & t & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \sqrt{2}\,t & 0 & -\mathbf{i}\,\sqrt{\frac{3}{2}}\,t - \frac{t}{\sqrt{2}} & 0 & -6\,\mu + 2\,U & 0 & 0 & 0 \\
\frac{3\,\mathbf{i}}{2}\,t & 0 & 0 & 0 & 0 & \frac{-\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{2\,\sqrt{2}} & 0 & \frac{-\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t - \frac{3\,t}{2\,\sqrt{2}} & 0 & t + \mathbf{i}\,\sqrt{3}\,t & 0 & 0 & 0 & -6\,\mu + U & 0 & \frac{-t}{2} \\
\frac{-3\,\sqrt{\frac{3}{2}}\,t}{2} + \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 & 0 & 0 & 0 & t & 0 & 0 & 0 & 0 & 0 & t & 0 & 0 & -6\,\mu + U & \frac{\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{2\,\sqrt{2}} \\
0 & \frac{\sqrt{3}\,t}{2} & \frac{-\left(\sqrt{\frac{3}{2}}\,t\right)}{2} + \frac{\frac{3\,\mathbf{i}}{2}\,t}{\sqrt{2}} & 0 & 0 & 0 & -\left(\frac{t}{\sqrt{2}}\right) & 0 & \frac{t}{\sqrt{2}} & 0 & \frac{\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{2\,\sqrt{2}} & 0 & 0 & \frac{-t}{2} & \frac{-\mathbf{i}}{2}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{2\,\sqrt{2}} & -6\,\mu + U
\end{bmatrix}
$$